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INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
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Forest Service

MOUNTAIN PINE BEETLE INFESTATION
WASATCH NATIONAL FOREST
UTAH

Appraisal Survey
1957

By
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INTRODUCTION

The mountain pine beetle, Dendroctonus monticola (Hopk.) has been active for many years on the Wasatch and Ashley National Forests. Losses of lodgepole pine have been reported practically every year since 1920. The seriousness of infestations have varied considerably. Artificial control was done between 1931 through 1936, with about 140,000 trees being treated. Again between 1940-1944 approximately 62,500 trees were treated. From 1948 through 1950 approximately 110,000 trees were killed on these forests. The beetle was relatively inactive until in 1953 a definite increase began and has continued to the present time. Since no direct control funds were available, only aerial and ground reconnaissance surveys were done during this period. In the fall of 1957 an appraisal survey was conducted, using both 5 percent and 1½ percent intensities.

Slightly more than 77 percent of the 293,375 acres of commercial timber on the Wasatch National Forest is lodgepole pine. About 64 percent of this is saw timber. The Wasatch has a minimum allowable annual cut of over 12 million bd. ft. of lodgepole pine saw timber and nearly 11,000 cords of pole size material. Contiguous to the Wasatch and seriously threatened by this infestation is the Ashley National Forest containing over 325,000 acres of lodgepole pine type with a commercial volume of approximately 1 billion bd. ft. This forest, too, has a long history of mountain pine beetle epidemics and is at present infested.

The majority of the present epidemic is within the Mountainview Ranger District of the Wasatch Forest. The transfer of this district from the Ashley to the Wasatch National Forest accounts for the change in report and infestation titles.

Survey Methods

Appraisal of the mountain pine beetle infestation on the Wasatch Forest was accomplished by a systematic ground survey. This survey employed both 5 percent and 1½ percent cruises. A 1/5-acre circular plot was established every 2 chains along parallel lines run in the cardinal direction most nearly perpendicular to the major contours. These cruise lines were spaced 20 chains apart for the 5 percent; 80 chains apart for the 1½ percent survey.

At each plot all newly attacked trees and trees attacked in 1956 ("red-tops") were recorded. At every tenth plot all green trees and trees attacked prior to 1956 over 6 inch DBH were tallied. Thus, estimates of trees were obtained for new attacks, 1956 attacks, attacks prior to 1956, and green trees. The data was taken by diameter class for additional information on size of tree attacked.

Results and Summary

All units surveyed were within areas with long histories of infestation. Approximately 110,340 newly infested trees were estimated for the 146,212 acres that the survey covered or an estimate of 0.75 newly infested trees per acre. The buildup ratio shows an over-all increase of 1.46:1 tree attacked in 1956. Five of the 10 units showed a very slight decrease (not more than a 0.4:1) but based on new attacks/acre on a forest wide average such a decrease is insignificant (Table 1.). One-third of the acres within the survey contain at least one infested tree per acre and have a buildup ratio of over 1:1, and the majority of the acres surveyed show at least a 1:1 buildup ratio.

Table 2 shows the percentage of trees by diameter classes that have been killed or infested. The larger diameter classes suffered proportionally the greatest losses. Roughly, 11 percent of the lodgepole pine stand in the surveyed area has been killed or is infested on the Wasatch National Forest.

No immediate lessening of "attacked-trees" intensity is foreseen at this time. From all indications the present infestation will continue to build up in 1958 at about the same ratio as in 1957.

Table 1.--1957 survey estimates of the mountain pine beetle infestation in lodgepole pine on the
Wasatch National Forest, Utah

| Unit | Acres | New attacks | Sampling error | Coef. var. | N.A./ac | Red tops | Buildup ratio NA:RT | Percent cruise |
|------------------------|---------|-------------|----------------|------------|---------|----------|---------------------|-----------------|
| 1. Hoop Lake | 13,422 | 18,760 | 4,179 | 22% | 1.40 | 11,700 | 1.6:1 | 5 |
| 2. Henrys Fk. | 22,992 | 16,240 | 3,403 | 21% | 0.71 | 11,120 | 1.5:1 | 1 $\frac{1}{4}$ |
| 3. Bridger Lk. | 16,816 | 11,360 | 3,589 | 32% | 0.68 | 6,720 | 1.7:1 | 1 $\frac{1}{4}$ |
| 4. Smith-Gilbert | 15,504 | 31,260 | 10,326 | 33% | 2.05 | 20,480 | 1.6:1 | 1 $\frac{1}{4}$ |
| 5. Hewinta | 21,200 | 25,120 | 8,575 | 34% | 1.18 | 18,080 | 1.4:1 | 1 $\frac{1}{4}$ |
| 6. Horse Creek | 19,872 | 5,920 | 1,421 | 24% | 0.30 | 5,840 | 1:1 | 1 $\frac{1}{4}$ |
| 7. E. Fk. Black Fk. GS | 3,664 | 860 | 230 | 27% | 0.23 | 1,280 | 0.67:1 | 5 |
| 8. Black Fk. Comm. | 12,288 | 40 | 25 | 63% | 0.003 | 100 | 0.40:1 | 5 |
| 9. Lily Lake | 16,918 | 100 | 52 | 52% | 0.006 | 180 | 0.56:1 | 5 |
| 10. Cow Hollow | 3,536 | 180 | 152 | 88% | 0.05 | 200 | 0.90:1 | 5 |
| Total | 146,212 | 110,340 | - | - | 0.75 | 75,700 | 1.5:1 | - |

Table 2.--Percent of each diameter class and total stand killed or infested in 1957, 1956 and prior on the Wasatch National Forest, Utah

| Unit | Diameter class | | | | | | | | | | Percent total stand |
|----------------------|----------------|----|----|----|----|----|----|----|-----|----|---------------------------|
| | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | |
| <u>Percentage</u> | | | | | | | | | | | |
| 1. Hoop Lake | 10 | 15 | 20 | 21 | 20 | 12 | 9 | 3 | 5 | 0 | 14 |
| 2. Henrys Fk. | 3 | 8 | 13 | 18 | 25 | 7 | 14 | 43 | 100 | 0 | 7 |
| 3. Bridger Lk. | 4 | 5 | 9 | 15 | 23 | 20 | 13 | 4 | 100 | 9 | 8 |
| 4. Smith-Gilbert | 9 | 14 | 21 | 23 | 10 | 35 | 35 | 23 | 9 | 0 | 15 |
| 5. Hewinta | 2 | 6 | 11 | 23 | 18 | 29 | 33 | 44 | 100 | 38 | 8 |
| 6. Horse Cr. | 3 | 7 | 5 | 6 | 11 | 17 | 33 | 27 | 37 | 33 | 6 |
| 7. E. Fk. Bl. Fk. GS | 4 | 8 | 14 | 14 | 12 | 15 | 13 | 10 | 100 | 2 | 10 |
| 8. Bl. Fk. Comm. | 1 | 1 | 2 | 3 | 4 | 9 | 0 | 14 | 10 | 22 | 2 |
| 9. Lily Lake | 2 | 2 | 4 | 2 | 3 | 10 | 0 | - | - | 0 | 2 |
| 10. Cow Hollow | 8 | 5 | 8 | 15 | 23 | 0 | - | - | - | - | 8 |
| Total | 4 | 8 | 11 | 18 | 17 | 24 | 38 | 33 | 46 | 25 | 9.5 |

WASATCH N. F. AREA OF INFESTATION

5% Survey

1 1/4 % Survey

